

on a backside of said gas introducing plate and another pressure within said etching chamber to be reduced, and wherein said difference is measured by said first and said second pressure detecting means.

REMARKS

Applicants, by their attorney, have amended the specification at pages 2 and 6 to correct certain typographical errors. These amendments are believed in good faith to add no new matter.

The proposed amendment to Fig. 2 brings it in compliance with MPEP § 608.02(g).

The amendments to claims 3, 4, 5 and 7 are submitted to overcome the rejections under the first and second paragraphs of 35 USC § 112. The undersigned attorney appreciates the suggestions provided in the Office Action by the Examiner relative to the claims.

Upon entry of the present amendment, claims 1-9 will be pending in this application. Claims 1-2 are withdrawn without loss of right or disclaimer of the subject matter thereof. For the reasons that follow, it is respectfully submitted that claims 3-9 are allowable over the applied art.

Brief Synopsis of Illustrative Embodiments

In accordance with an exemplary embodiment of the present invention an apparatus for manufacturing a semiconductor device comprises a pressure detecting means provided inside an upper electrode that supplies gas in a parallel

plate etching apparatus. Usefully, the pressure detecting means monitors the pressure, and if a fluctuation in the pressure occurs that indicates the occurrence of defective conditions. As such, the etching can be ceased.

In accordance with another exemplary embodiment a second pressure detecting means may be used in concert with the pressure detecting means described immediately above to determine a difference therebetween. This measurement may be used to terminate the etching process.

Rejection in view of Loan, et al.

Claims 3-7 were rejected under 35 USC § 103(a) as being unpatentable over Admitted prior art in view of Loan, et al. (U.S. 6,296,711)

The establishment of a *prima facie* case of obviousness required that *all* of the elements be found in the prior art. Moreover, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is a teaching, suggestion or motivation to do so found in the references relied upon. However, hindsight is never an appropriate motivation for combining references and/or the requisite knowledge available to one having ordinary skill in the art. To this end, relying upon hindsight knowledge of applicants' disclosure when the prior art does not teach nor suggest such knowledge results in the use of the invention as a template for its own reconstruction. This is wholly improper in the determination of patentability.

Finally, and of particular significance in the present discussion, it is established that just because features of two previously used devices are combined

into applicant's invention does not render the invention unpatentable 35 USC § 103(a). To this end, the claim must be considered as a whole, and the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination. It is respectfully submitted that for the reasons discussed herein, there is no such suggestion in the prior art.

The apparatus of independent claims 3 and 5 is used in the manufacture of semiconductor devices. The apparatus includes a parallel plate dry etching apparatus. The apparatus further includes (one or more) pressure detecting means. The pressure detecting means is particularly useful for the determination of fluctuations in the pressure, which can be indicative of defective conditions. The etching process can be stopped in the event of such defective conditions.

Clearly, pressure gauges and parallel plate etching devices are known. However, it is respectfully submitted that their **combination** as recited in independent claims 3 and 5 **are new and unobvious**. The reference to *Loan, et al.* is drawn to a apparatus for forming layers by chemical vapor deposition (CVD). The pressure sensors 51 and 53 are used in the monitor of reactant vapor flow, and ultimately to monitor and control the process.

As stated, the apparatus described in *Loan, et al.* is a **deposition** apparatus, and not the parallel plate etching apparatus as recited in independent claims 3 and 5. Moreover, the reference to *Loan, et al.* does not describe etching processes or apparatus and therefore *would not* describe the desirability of providing a pressure detecting apparatus as is set forth in claims 3 and 5. Accordingly, because the reference does not teach nor suggest the desirability of combining a pressure

detecting means in a parallel plate dry etching apparatus claims 3 and 5 are not rendered obvious. It is respectfully submitted that to assert otherwise is the improper use of Applicant's invention as a template for its own reconstruction. Clearly, this is wholly improper in the determination of patentability.

For the reasons set forth above, it is respectfully submitted that the rejection under 35 USC § 103(a) of claims 3-7 is improper and should be withdrawn. Moreover, because claims 3 and 5 are believed to be allowable newly added dependent claims 8 and 9 are also allowable.

CONCLUSION

In view of the foregoing amendments and remarks, reconsideration and withdrawal of all objections and rejections are respectfully requested. An early notice of allowance is earnestly solicited.

Except as otherwise stated in the previous Remarks, applicants note that each of the amendments have been made to place the claims in better form for U.S. practice or to clarify the meaning of the claims; not to distinguish the claims from prior art references, otherwise narrow the scope or comply with other statutory requirements.

In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact William S. Francos, Esq. (Reg. No. 38,456) at (610) 375-3513 to discuss these matters.

Petition is hereby made for a two-month extension of time under 37 CFR §1.136, extending the period of response from May 13 to July 15, 2002. Permission

is hereby given to charge Deposit Account Number 50-0238 the required fee under 37 C.F.R. §1.17.

If necessary, the Commissioner is hereby authorized in this, concurrent, and further replies to charge payment or credit any overpayment to Deposit Account Number 50-0238 for any additional fees under 37 C.F.R. §1.16 or under 37 C.F.R. §1.17.

Respectfully submitted on behalf
of:

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Marked Up Version of Amended Paragraphs in the Specification

[At page 2, line 4] When the gas-introducing plate 4 lying within the processing chamber of the etching apparatus is used up, the gas-introducing plate 4 becomes thin as shown in Fig. 5. Further, the gas holes 3 defined in the gas-introducing plate 4 reach a given size or more respectively, the following would occur. Plasma enters the backside (cooling plate side) of the gas-introducing plate from the etching-processing chamber 9 through the enlarged gas holes 3. Designated at numeral 10 in Fig. [5] 2 typically illustrates the entrance of the plasma into the backside of the gas-introducing plate 4. When the plasma enters therein, the state of discharge of the plasma on the wafer side becomes unstable. As a result, an etching characteristic is deteriorated and the wafer 8 is unusually processed.

[At page 6, line 19] Fig. [1] 3 shows a processing chamber of an etching apparatus according to a first embodiment of the present invention. It is identical in basic configuration to a conventional one. In the conventional etching apparatus, such a device as to detect a plasma was not placed on the backside (on the cooling plate 2 side in Fig. 1) of a gas-introducing plate 4. In the first embodiment, a plasma detector 11 is placed on the backside of the gas-introducing plate 4. A commercially available detector may be used as the plasma detector 11. It is however desirable to use a high-sensitive plasma detector capable of detecting even slight plasma. Further, the plasma detector 11 is placed in a position where it is most easy to detect the plasma.

Marked Up Version of Claims

[3.] An apparatus for manufacturing a semiconductor device, comprising:
an upper electrode; and a pressure detecting means provided inside [an] said upper electrode [for supplying gas, of] which supplies gas to a parallel-plate dry etching apparatus.

[4.] The apparatus according to claim 3, wherein said upper electrode comprises a cooling plate having a plurality of gas supply holes for supplying the gas; a gas-introducing plate having gas holes for introducing the gas onto a semiconductor wafer[,] ; and a jig for fixing said gas-introducing plate to said cooling plate, [and means for detecting pressure, which] wherein said pressure detecting means is provided between said gas-introducing plate and said cooling plate.

An apparatus for manufacturing a semiconductor device, comprising:

[5.] An apparatus for manufacturing a semiconductor device, comprising:
an upper electrode; a first pressure detecting means provided inside an upper electrode [for supplying gas, of] which supplies gas in a parallel-plate [type] dry etching apparatus; and a second pressure detecting means provided within [an etching-processing chamber] said dry etching apparatus in which a wafer is placed.

[7.] The apparatus according to claim 5, wherein said upper electrode comprises a cooling plate having a plurality of gas supply holes for supplying the gas, a gas-introducing plate having gas holes for introducing the gas onto a semiconductor wafer, a jig for fixing said gas-introducing plate to said cooling plate, [and] wherein said first

pressure detecting means [for detecting pressure, which] is provided between said gas-introducing plate and said cooling plate, and wherein said second pressure detecting means is provided within [the] an etching[-processing] chamber in which [the] said wafer is placed.